
3.0 NATURE AND EXTENT OF CONTAMINATION

The primary sources of contamination at the Site are waste materials from the SGP and ATC. These wastes are residuals or by-products from the coal gasification process and tar processing and include hydrocarbons, light and heavy polycyclic aromatic hydrocarbons (PAHs), and some inorganic compounds.

3.1 SOILS

Constituents typically associated with the former SGP and ATC operations were detected in soil samples at depths up to 80 feet below ground surface that include Volatile Organic Hydrocarbons (VOCs), Semivolatile Organic Hydrocarbons (sVOCs), PAHs, and inorganic compounds. Nonaqueous Phase Liquid (NAPL) or "free phase" product as a black tarry substance, and "free phase" coal were observed in some soil samples. Studies reveal the presence of many of these chemicals with PAHs being the widest spread and in the highest concentrations. Figure 7 shows the areas where the carcinogenic PAHs exceed the MTCA Method A cleanup level. Figures 5 and 6 show the depth of contamination in two cross-sections. Other organic and inorganic chemicals have been found in the same areas where the PAHs are found. Table 3 shows the frequency and maximum concentrations of the different constituents detected in site soils.

3.2 GROUND WATER

The evaluation of ground water quality is based on several samples collected from 28 monitoring wells installed in three aquifer zones, located adjacent to and below the areas of affected soil (see Figure 4). Ground water inside the area of soil contamination as outlined in Figure 7 is assumed to be contaminated.

Ground water data analyzed are primarily from monitoring wells constructed outside of the areas where NAPL or soil contamination was observed. Table 4 shows the frequency of the constituents detected. Only low levels of contaminants that do not exceed the cleanup levels were detected.

Evaluation of natural attenuation parameters in ground water shows that natural attenuation processes such as aerobic biodegradation and oxidation are occurring at the Site. These indicators, presented in the Second Supplemental and Remedial Investigation Report, include free carbon dioxide, sulfate, methane, and nitrogen and were measured in wells screened within the source area, near the source area, below the source area, and away from the source area,

3.3 SURFACE WATER AND SEDIMENT

No constituents above MTCA cleanup levels were identified in sediments and in surface water samples from the Spokane River. Table 5 shows the analytical results compared with the applicable criteria.

3.4 CONTAMINANT TRANSPORT

The contamination at the Site is an area of soils containing constituents related to coal and coal tar with pockets of NAPL or free-phase waste coal tar in the surface and subsurface soils. Ground water within this NAPL affected area is contaminated. Current data show that ground water contamination is not migrating out of the affected area at rates that would result in cleanup level exceedances. The limited extent of ground water contamination detected outside of the impacted soil areas indicate that the source materials generally have low solubilities, and any constituents that may be partitioning into ground water are rapidly attenuating through natural physical, chemical, and biological natural attenuation processes.

Ground water flow is predominantly from the river to the Site and down into the intermediate aquifer for most of the year. During periods of peak runoff in the late spring to early summer, the ground water gradient has been observed to be toward the Spokane River.

3.5 RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

The Site is zoned and currently used for commercial or industrial purposes. Commercial purposes may include dwelling units. The owners have filed an application with the City of Spokane for a proposed mixed development use at the Site that includes an apartment dwelling.

The following are potential exposure pathways identified for the Site:

Soil

Human contact (dermal, incidental ingestion, or inhalation) with contaminated soils including exposure to workers and visitors on Site.

Transport of constituents in site soils to ground water at concentrations that could cause exceedances of ground water cleanup levels.

Ground Water

Human exposure through ingestion, inhalation, or dermal contact to site constituents in ground water from its use as a potable water source;

Human ingestion of water or aquatic organisms in the Spokane River affected by site constituents in ground water discharging to the Spokane River;

Exposure of aquatic biota to constituents by exposure to constituents in Site ground water discharging to the Spokane River.